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ABSTRACT

A distance-learning personnel-preparation course on transdisciplinary services for students with low incidence disabilities was developed through collaboration among four Kentucky institutions of higher learning. The course, "Transdisciplinary Services to Students with Deafblindness and Other Multiple Disabilities," was delivered to eight Kentucky locations using compressed video (two-way audio and two-way visual). This technology was chosen because it provided for direct student interaction, eliminated the need for specialists to travel to deliver lectures, and promoted class activities such as discussion. The course was viewed by 60 students enrolled in the University of Kentucky, Morehead State University, Breschia College, and the University of Louisville. In a postcourse evaluation, the overall rating was in the upper quartile. The advantages of the course were that Kentucky students had equal access to the same best-practice information, and the regional exchange of experience and dialogue provided all students with information needed to implement the concepts anywhere in the state. While technology and diversity were crucial contributors to the course's value, they were also at the heart of the challenges encountered. Recommendations to address these challenges include development by collaborating faculty of a common philosophy of instruction that includes appropriate interactive instructional activities and an understanding of the student body; guidance for students on use of the technology and rules related to mutual respect and on-line interaction; guidelines related to student on-line time that assure equal access yet effectively manage class time; and ongoing evaluation to continually adjust content and presentation. Two tables present evaluation findings. (TD)

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(Submitted for publication)

Historically, the retention and recruitment of special education teachers, particularly those certified in low incidence disabilities, has been a problem for rural school districts (Gold, Russell, & Williams, 1993; Helge, 1981). Distance learning technology offers a means by which institutions of higher learning (IHE's) can pool their resources and collaborate to deliver courses that require expertise that might be available statewide (Barker, 1992).

Several IHE's in Kentucky have joined their resources to meet needs unique to personnel preparation programs in low incidence disabilities. In response to the 1990 Kentucky Education Reform Act (KERA) (Miller, Nolan, & Schaaf, 1990), IHE's in Kentucky began to examine their teacher education programs and to make changes that ensured that the personnel they trained met new state standard outcomes in the certification area of Moderate/Severe Disabilities (MSD). One of the competencies required of personnel seeking certification in this area was the ability to provide transdisciplinary services for students with low incidence disabilities (Orelove & Sobsey, 1996). The course created to teach this competency relied on the expertise of both special educators and related service delivery personnel. Finding personnel to offer such a course proved to be a dilemma for IHE's across the state. As a result, a multi-university effort was utilized to deliver this course content.

The purpose of this article is to describe the development and content of a multi-university course in transdisciplinary services offered via distance learning technology that resulted from a collaborative effort between MSD program personnel at IHE's in Kentucky. In particular, the article focuses on the collaborative relationship that developed between Morehead State University (MSU), a rural regional university that serves Eastern Appalachian Kentucky, and the University of Kentucky (UK), located in Central Kentucky. The success of this collaborative undertaking has implications for the development and delivery of similar collaborative distance learning courses offered through other IHE's and multi-state or regional programs that prepare personnel to serve rural low incidence populations.

Development

A brief history of the impetus for the development of the multi-university course is in order to fully understand the level of collaboration needed for successful delivery of coursework in this fashion. In 1992, shortly after KERA was enacted, a Higher Education Task Force, comprised of faculty from all of Kentucky's MSD programs, decided there was a need to restructure the certificates for teaching students with moderate and severe disabilities. The current certification program required dual certification in elementary education, resulting in lengthy programs (greater than 160 hours in some cases) for undergraduates and low graduate rates in that area. The Higher Education Task Force decided that a single certificate was needed that (a) did not require elementary certification, (b) encompassed competencies for teaching learners with both moderate and severe disabilities, and (c) required coursework in elementary or secondary education so that students could get an additional certification if desired. The Higher Education Task Force developed competencies that they subsequently submitted to the Kentucky Standards Board and, in 1994, a new teaching certification in MSD was endorsed.

The year following the development of the teaching certificate, the Higher Education Task force revisited the competencies and determined areas where specific personnel preparation

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programs would have implementation difficulties with the new certificate. Two of the areas they identified were transdisciplinary services and education of learners with the most severe disabilities, including deafblindness. Faculty from rural areas of the state were concerned that they did not have adequate faculty resources to teach courses in these areas. Specifically, in the area of transdisciplinary services, faculty were concerned that there were few specialists (e.g., physical or occupational therapists) in their region of the state who could deliver the course content. As a result of these concerns, the Kentucky Deafblind Project (operated out of the UK) was invited to develop a course on the delivery of transdisciplinary services to students with Deafblindness and Multiple Disabilities. The resulting course, entitled Transdisciplinary Services to Students with Deafblindness and Other Multiple Disabilities, was developed with input from professionals from other disciplines, including speech/language pathology, occupational therapy, physical therapy, nursing, and visually impaired services and piloted at UK in the Spring of 1995.

Following the initial offering in 1995, the Task Force examined the course content and evaluations. At that time, UK invited IHEs with MSD certification programs to participate in the course the following year. Faculty from MSU, Brescha College (a small denominational college in rural Western Kentucky), and the University of Louisville (U of L) (an urban IHE in northern Kentucky) indicated a need for the course content and stated that the course would fit into their existing curricula. In order to offer the transdisciplinary course to multiple sites, the Task Force determined that distance learning technology was the best choice for multi-university course delivery.

Once the participants were identified, they held two planning meetings via compressed video (two-way audio and two-way visual delivery) to negotiate physical, fiscal, and scheduling issues, as well as the roles and responsibilities of all cooperating/coordinating faculty. The group first made the decision to offer the course via compressed video, as opposed to satellite delivery. Their rationale for this decision was that (a) students from rural and urban programs could interact directly with one another, (b) any discipline specialist from another location would not have to travel to UK to delivery a lecture, and (c) some class activities (e.g., discussions) could be accomplished more effectively with this medium. Since the program's primary transmitting site was at UK, both on- and off-campus UK students had access to the course.

Second, fiscal issues required resolution, since some of the participating programs did not have access to the technology. The Associate Dean of Distance Learning at UK, who was committed to a multi-university effort, agreed to open compressed video classrooms at any of the UK Community College sites needed to accommodate students from other locales, with the stipulation that at least one UK student was registered at that site as well. For example, Brescha College needed access to the classroom at Owensboro Community College. This was acceptable because one student participating in U.K.'s TREK-DL project viewed courses from that site.

Scheduling was the third issue determined by the group. Typically, courses offered through distance learning are scheduled approximately one year in advance. Given that it was less than 6 months before the spring semester, the options for dates and times of class offerings were limited. As a result, the group scheduled the class to meet bi-monthly on Saturdays for 4 hours per session. This did not interfere with class offerings at any of the participating programs and allowed the use of compressed video delivery, which had not been scheduled for use during that time slot.

The roles and responsibilities of the cooperating/coordinating faculty were the last issues discussed during the planning sessions. The first author, who was involved with the development of the course, was the lead instructor. Two of the three participating programs used the course in its entirety. In other words, at MSU and U of L, students used the same course syllabus as UK students, including the same requirements, readings, etc. At Brescha College, the faculty member chose to use sections of the course for particular course lectures in existing courses she was

teaching. Faculty at MSU and U of L were responsible for grading their students' assignments and disseminating materials, such as quizzes and handouts, sent to them by the lead instructor. The lead instructor for the course was responsible for (a) coordinating the guest lectures of the specialists, (b) disseminating handouts and materials to all sites, (c) conducting a majority of the course lectures, and (d) grading the work of all UK students. In addition, the UK Office of Distance Learning Programs supported a site monitor at each UK locale who operated the technology and, at sites without a faculty member, disseminated materials, proctored quizzes and conducted course evaluations. Site monitors through MSU and U of L had similar responsibilities.

Implementation

After almost 9 months of planning, the multi-university course was implemented via compressed video in the Spring, 1996, semester. In all, approximately 60 students from four colleges and universities attended the course (UK- 22; MSU - 13; U of L - 15 and Brescha - approximately 8). Although initially designed for students in the MSD program, students in other areas of special education (e.g., ECSE) and related services (e.g., SLP) also took the course. As well, by offering the course as a 500 level course, UK was able to offer the course for both graduate and undergraduate credit. Students viewed the course from eight different locations, including three universities and four community college sites. Although UK students were located at all sites, students from other programs attended class at locations different from their fellow students in some circumstances.

The underlying philosophy of educating learners with Deafblindness and Multiple Disabilities is that it requires a team to deliver services (Orelove & Sobsey, 1991). Faculty representing disciplines that would be involved in the education of students with these disabilities taught sections of the course related to their area of expertise (i.e., physical and occupational therapy, speech/language pathology, nursing, and vision). Although the lead instructor delivered lectures on basic concepts related to assessment and programming (Rainforth, York & Vandercook, 1992), this cadre of professionals delivered much of the specific content. The lead instructor used a videotaped assessment of a young girl with Deafblindness as a case study to generate discussion among team members. As well, all lecturers in the course utilized videos of other children with multiple disabilities to provide examples to students of specific instructional issues (e.g., augmentative communication, feeding techniques, and adapted equipment).

To increase interaction between students at different sites, the lead instructor attempted to plan an activity each week that required reflective practice (Major, 1996) of the information covered in class. In this approach to teaching, students were given a problem or issue related to the course content and asked to work with other students at their site to brainstorm solutions and then report back to the instructor. For example, students were asked to identify learning outcomes for a case study utilized throughout the course. By using this approach, students had an opportunity to interact with fellow students and instructors at their respective sites. As well, students had the opportunity to gain insight from students at other sites both from their own as well as other programs. This method increased communication by all involved in the course.

Evaluation

The instructors conducted an evaluation of the course that asked all students to rate both the content (i.e., quality of the course presentations) and the form of the course. In addition, the form provided an opportunity for students to submit written comments on various aspects of the course. (These are addressed in the following section.) The 11 topics and 6 course components addressed on the evaluation are outlined in Table 1. Each item was ranked using a 5 point Liekert scale with 5 indicating the highest ranking and 1 the lowest. Table 1 provides an overview of the results of this evaluation. The mean ranking of each item by all the students (total n=37) completing the evaluation at six (6) of the participating locations is indicated in each column. The bottom row in

Table 1 provides an overall average rating for that site based on the total of all the individual ratings. The final column provides a summary mean rating of each item across all settings.

Overall Evaluation.

The combined rating of the various components ranged from 3.50 to 4.51. The success of the course can be seen in the fact that, on average, all aspects of the course were rated in the upper half of the scale, As well, the overall rating fell in the upper quartile. Cooperating faculty were generally pleased with these ratings for a new course that attempted to address the needs of a diverse student body and called on the students to participate in a non-traditional learning experience. Nonetheless, the range of ratings, the variation across settings, and some of the written comments submitted by students highlight important considerations for future offerings of this or other courses.

The lowest rated aspect of the course was the use of compressed video. While the technology made this unique collaborative course possible, the problems associated with it led to this ranking. Several of the settings experienced problems with the reception of some classes because of difficulties with the transmission network. Additionally, minor distortion and reorientation associated with the compression process was mentioned as a reason some students disliked this method of instruction. The distortion associated with the use of compressed video became pronounced when a videotape is broadcast over the video network. The problem of the disconcerting images may have contributed to the mean rating of 3.67 that students gave to the assessment video.

The problem of interacting with a speaker who was presenting on a television screen seems to have inhibited the ability of some students to ask questions or otherwise interact with lecturers. This inhibition also seems to have limited the effectiveness of several of the presentations, most notably those on occupational therapy, physical therapy, and oral/motor feeding. These particular sessions presented a great deal of content that was new to most of the students and relied heavily on a traditional lecture format. The slightly higher average rating associated with the lecture on vision reflects the fact that this presentation originated from the site where students rated this presentation higher than any other.

While there is variation in the rating of the various course components, it is noteworthy that the range on all rankings was only one point. The cooperating faculty were encouraged to see that the majority of the classroom practices were rated in the upper end of the distribution with the crucial topics of transdisciplinary services and program planning, two areas that formed the central content of the course, being rated in the top three.

Discussion

As noted above, this course grew out of an already existing inter-university collaborative effort. This relationship was crucial to establishing the course and absolutely necessary for its ongoing refinement. The commitment to working together and the positive relationship among faculty was essential for honest reflection on the successes and limitations experienced during this course. Indeed, the faculty found themselves required to implement a truly transdisciplinary (or at least trans-institutional) process to ensure the success of this course. The cooperating faculty consulted regularly during the offering of the course and conducted a series of meetings and phone conversations in the subsequent summer and fall as a post-mortum intended to refine the course for its next offering.

While encouraged by the overall success of the course, all of the collaborators were aware of the need for further development and refinement. The following analyses grew out of this ongoing dialogue and reflects the integration of the evaluation data, the students' written and oral comments, faculty observation of student behavior, and the process of group reflection by the

faculty. As the collaborating faculty attempted to organize the disparate sources of information about the course, a series of recurring themes emerged. It is noteworthy that generally these central issues were multidimensional. That is, each of them presented certain opportunities or advantages, while simultaneously presenting a potential pitfall or challenge. Table 2 outlines these major themes and provides a summary statement of advantages and challenges experienced.

Advantages.

All of the advantages outlined in Table 2 can be summarized under the rubric of "equal access." Traditionally, there has been a significant disparity between the educational opportunities available students who elect to attend a university in an urban area. At the most basic level, students who select regional institutions for their higher education experience will not have comparable access to the range of expertise related to the needs of students with severe and multiple disabilities.

This discrepancy does not reflect a lower quality of teacher preparation or inferior faculty at the regional institutions. It is primarily a result of the lack of access to a full array of disciplines required to meet the needs of low incidence, high need students. A variety of disciplines, beyond education, may not represented on the campuses of some of the rural regional institutions. In truth, many rural school districts have a difficulty contracting with providers from disciplines, such as occupational therapy, to meet the needs of their students. When the focus turns to individual professionals with extensive background with students with complex needs, such as deaf-blindness, the pool of rural professionals is essentially non-existent. The net result is that those few professionals who are working in the rural area are overwhelmed with direct service and are not available for even an occasional guest lecture. Further, this absence of sufficient professionals in rural areas frequently means that students even lack the ability to observe best practice in transdisciplinary collaboration during their field experiences in local schools.

This course assures that students across the state of Kentucky have access to the same best practice information. In this regard, the transdisciplinary course fell under the umbrella of Kentucky's extensive effort at educational reform by assuring that all teachers of students with moderate and severe disabilities were prepared in a manner consistent with the state's teacher standards. Also, the dialogue and regional exchange of experience provided all the students with information needed to effectively implement the concepts taught in the course anywhere in the state.

Challenges.

While technology and diversity were two crucial contributors to the value of this course, these two factors lay at the heart of major challenges encountered. A review of the challenges associated with the themes in Table 2 indicates a clear need for faculty and students to develop the skill and comfort required by a new instructional technology.

Using compressed video is not the same as watching a videotape in class or the use of techniques, such as satellite classes. This new technology presents a valuable new media, but it requires that instructors adjust their presentation to use it effectively. Some policy makers have suggested that compressed video technology can be used to allow a single instructor, in a central location, potentially deliver information to hundreds or thousands of students in multiple locations. The experience in this course suggested that such a vision is only valid for the most traditional college instruction for large anonymous lecture classes. In truth, compressed video, with its potential for true interactively is not really necessary for the traditional lecture approach, which may be better suited for satellite delivery. Compressed video instruction is ideal for use in advanced courses in teaching methods or other disciplines which require ongoing interaction between professor and student. However, it is crucial that the interaction be built into all aspects of the course. Only by systematically requiring interaction can the instructor "teach" the students to become comfortable with the technology and not fall into patterns of passive television viewing.

The relationship between the potential for interactively and a diverse student body leads to several totally unanticipated challenges. In general students based in cities were more comfortable with the technology. This led to several highly vocal students at times seizing control of the transmission for extended periods of time to argue over a disagreement with the instructor. While this has potential value in clarifying an obscure or difficult point, in the cases experienced, the issues involved expectations of people with severe disabilities and attitudes towards parents.

A similar challenge emerged when students at one site continually communicated lack of respect for students from a rural background. This interaction reached its nadir when one person was heard demeaning the dialect and background of the students from rural Eastern Kentucky on the open microphone. Obviously, there is potential for this type of problem in any setting where individuals from diverse backgrounds interact, but the physical proximity of a person usually will mean that prejudiced or stereotypic attitudes will not be public expressed. Unfortunately, in the case of compressed video, the distance created by the television monitor provided the protection needed to insult about a quarter of the course participants. Conversely, the immediacy of the media did not shield the hearers.

Recommendations

Based on the experience of the transdisciplinary course delivery in Kentucky, the authors want to offer the following recommendations for any institution or consortium of institutions planning to use compressed video in a manner similar to the one described here.

1. Collaborating faculty and any guest lectures must meet well in advance to develop (a) a common philosophy of instruction, (b) appropriate interactive instructional activities, (c) an understanding of the nature of the student body, and (d) a complementary perspective on course content.
2. Students should be given clear guidance on use of the technology and appropriate rules related to mutual respect and on-line interaction.
3. A clear set of guidelines, related to student on-line time that assure equal access and yet provides for effective management of class time should be articulated.
4. A clear common philosophy of expectations related to the target population of students with disabilities and their families should be stated and reinforced through consistent reminders about such factors as the use of "people first language".
5. Systematic and on-going evaluation data, beyond standard institutional course evaluations, should be collected and used to continually adjust content and presentation.

Conclusion

The first offering of the transdisciplinary course using compressed video faced a wide range of challenges. Nonetheless, the collaborating faculty remain convinced that this is an invaluable tool for enhancing the skills of teachers of students with the most severe disabilities all across Kentucky. None of the difficulties encountered are insurmountable and the potential benefits are significant. At the end of the twentieth century, it is no longer acceptable that distance and isolation serve as an excuse for qualitative differences in the educational opportunities available to teachers-in-training in rural areas. A free, appropriate, public education is guaranteed to all students with disabilities. The fact that a student lives in a rural community does not modify that right. It is the responsibility of State Education Departments and IHEs to learn to work together, using state of the art technology, to ensure all teachers are prepared with state of the art information and quality instructional experiences.

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Table 1

Mean Ranking of Course Components By Participants

	University of Kentucky				Morehead	University	Combined
	Lexington	Ashland	Covington	Hazard	State	of Louisville	
	n=6	n=4	n=2	n=5	n=9	n=11	n=37
Course Topics							
Transdisciplinary Services	5.00	4.75	5.00	4.40	4.33	4.22	4.51
Assessment Lecture	4.67	4.25	5.00	4.40	4.22	3.60	4.19
Assessment Video	4.50	3.75	3.50	3.20	4.22	2.90	3.67
Consensus Activity	4.33	4.50	4.50	4.00	4.00	3.43	4.03
Program Planning	4.83	4.25	4.00	4.20	4.22	4.09	4.27
Physical Therapy	4.33	4.00	3.00	3.60	3.22	4.10	3.78
Occupational Therapy	4.33	3.75	4.00	3.60	3.89	3.80	3.89
Oral Motor/Feeding	4.33	4.25	3.50	3.00	4.11	3.80	3.89
Communication	4.67	4.50	4.50	3.00	4.00	3.78	4.00
IEP Development	5.00	4.50	5.00	4.00	3.22	4.09	4.11
Vision	4.67	4.50	4.50	3.80	4.22	4.73	4.43
Course Format							
Organization	4.83	4.00	4.50	4.00	3.89	3.27	3.92
Lectures	4.67	4.25	4.00	4.60	3.67	3.45	3.97
In-class Activities	4.33	4.75	4.00	4.20	4.00	3.55	4.03
Scope	4.83	4.75	4.00	4.60	4.11	3.18	4.08
Projects	4.83	4.75	4.50	4.40	3.89	3.40	4.11
Compressed Video	3.50	3.75	4.50	4.00	3.33	3.10	3.50
Mean Overall Rating	**4.57**	**4.31**	**4.24**	**3.94**	**3.92**	**3.68**	**4.01**

TABLE 2

Comparison of Advantages and Challenges Associated with Offering a Multi-site, Inter-university, Compressed Video Course

Advantages	Challenges
THEMES	
Diversity	
Sharing of multiple divergent perspectives	Assuring respect and tolerance for different backgrounds
Enrichment that comes from experienced students interacting with inexperienced	Assuring that instruction meets needs of all levels; tolerance of need for clarification for less experienced students
Compressed Video Technology	
Opportunity for direct interaction with students at multiple sites	Student comfort and passivity, overcoming "TV Watching" behavior and fear of being on camera
Opportunity for varied multimedia presentations in class	Technology break down; anomalies in the video transmission that hamper student attention
Time	
Scheduling to meet the needs of nontraditional students, teachers, & others employed full time	Scheduling access to the technology at so many separate locations
Communication	
Ability to effectively explore issues in a manner that increases student awareness of the range of situation they may encounter, opportunity to seek clarification of presentation	Possibility for a single student to "seize the microphone" and dominate the transmission; possibility for some students to effectively hide and the background and never be engaged in dialogue
Convenience	
Students are able to obtain instruction close to home	Lack of opportunity for students at distance sites to "get to know" an instructor
Multiple Instructors	
Diverse expertise and perspectives--a very rich learning experience in which each class is given by an expert	Instructor use of and comfort with the technology; possibility for expert to present material that is over the head of the average student
Cost Effectiveness	
Provides equal access to information to students in all areas of state; Very affordable means to meet needs of state	Labor and technology intensive for each of the individual institutions - not clear it saves them money
Collaboration	
Development of strong working relationship among faculty at diverse institutions	Time needed to achieve this relationship; administrative understanding of the need for this use of time